

CLAIMS

1. A method for determining/dimensioning measures for restoring an electrical power system, which experiences or is heading for a voltage collapse, to a normal condition,
5 **characterized by**
 - determining the actual voltage/phase angle in the electrical power system,
 - determining the power unbalance within at least one
10 sub-area in the electrical power system,
 - determining suitable power-balancing measures,
 - dimensioning the extent of the respective measure, and
 - carrying out the power-balancing measures.
- 15 2. A method according to claim 1, **characterized** in that the determination of the actual voltage/phase angle is performed by measuring in at least one node in the sub-area.
3. A method according to claim 1 or 2, **characterized** in that
20 the determination of the actual voltage/phase angle in the electrical power system is performed by measuring in at least one node and by calculation.
4. A method according to claim 1, 2 or 3, **characterized** in
25 that the power unbalance is determined based on the actual voltage/phase angle and the desired voltage/phase angle.
5. A method according to one or more of the preceding claims, **characterized** in that the power unbalance is determined
30 starting from a circuit calculation based on the actual and the desired voltage/phase angle.
6. A method according to claim 4, **characterized** in that the power unbalance is determined starting from a comparison
35 of the actual voltage, the voltage drop across a magnitude related to the source impedance, and the equivalent voltage of the source.
7. A method according to claim 6, **characterized** in that

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the magnitude related to the source impedance is source impedance, source admittance, short-circuit power or short-circuit current.

- 5 8. A method according to one or more of the preceding claims, **characterized** by disconnection of a load corresponding to the determined power unbalance, such that the voltage/phase angle returns to the desired/predetermined level.
- 10 9. A method according to one or more of the preceding claims, **characterized** in that power, corresponding to the determined power unbalance, is supplied to the electrical power system such that the voltage/phase angle returns to the desired/pre-determined level.
- 15 10. A method according to one or more of the preceding claims, **characterized** in that power, corresponding to the determined power unbalance, is redistributed within the electrical power system by controlling reactive power
- 20 resources such that the voltage/phase angle returns to the desired level.
11. A method according to one or more of the preceding claims, **characterized** in that power, corresponding to the
- 25 determined power unbalance, is redistributed within the electrical power system by controlling dc connections such that the voltage/phase angle returns to the desired level.
12. A method according to one or more of the preceding
- 30 claims, **characterized** in that the power unbalance is determined based on a simultaneous comparison of the actual phase angle and the desired phase angle and of the actual voltage and the desired voltage.
- 35 13. A method according to one or more of the preceding claims, **characterized** in that determination/dimensioning of measures is based on the magnitude of the detected power unbalance and the possible power-balancing means in the area.

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14. A method according to one or more of the preceding claims, **characterized** in that addition of power to the electrical power system and disconnection of loads from the electrical power system are combined such that the power-
5 balancing measures together correspond to the determined power unbalance.

15. A method according to one or more of the preceding claims, **characterized** in that disconnection of loads is
10 performed in a predetermined order of priority.

16. A method according to one or more of the preceding claims, **characterized** in that the order of priority is stated in a table.

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17. A method according to claim 16, **characterized** in that the table contains information about which switching members are available within the area.

20 18. A method according to claims 16 and 17, **characterized** in that the table contains information about what power change is caused by activation of the respective switching members.

19 A method according to one or more of the preceding claims,
25 **characterized** in that, based on the information in the table, a required number of switching members is selected so that the necessary power change is achieved.

20. A method according to one or more of the preceding
30 claims, **characterized** in that the table is regularly updated.

21. A method according to one or more of the preceding claims, **characterized** in that the load disconnection is executed manually.

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22. A method according to one or more of the preceding claims, **characterized** in that the load disconnection is executed automatically.

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23. A device for determining/dimensioning measures for restoring an electrical power system, which experiences or is heading for a voltage collapse, to a normal condition, characterized in that

- 5 - means are arranged for determining the actual voltage/phase angle in the electrical power system,
- means are arranged for determining the power unbalance within at least one sub-area in the electrical power system,
- 10 - means are arranged for determining suitable power-balancing measures,
- means are arranged for dimensioning the extent of the respective measure, and that
- means are arranged such that the selected measures can
- 15 enable the electrical power system to be restored to a stable condition.

24. A device according to claim 23, characterized in that means are arranged to determine the actual power unbalance

20 starting from a circuit calculation based on the actual voltage/phase angle and the desired voltage/phase angle.

25. A computer program for carrying out the method steps according to one or more of claims 1-22.

25 26. A computer-readable medium containing at least parts of a computer program according to claim 25.

27. A computer program according to claim 25 which is at

30 least partly transferred via a network such as, for example, the Internet.

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